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Mortality in older children and adolescents: the forgotten ones



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What happens in childhood has profound implications for adult life and for national development. Conventionally, particularly in the Millennium Development Goals era, attention on child health focused on under-5 mortality. Globally, under-5 mortality declined by 55% between 1990 and 2016, with Europe being one of the few regions exceeding a 70% decline.¹ But gains in under-5 mortality have not been consolidated in later childhood. Globally, the decline in mortality in children aged 5–14 years has been a more modest 44%, corresponding to an estimated mean of about 1 million (95% CI 0.9–1.1 million) deaths in 2016.¹ Thus, the continuing mortality burden in children aged 5–14 years in all regions of the world makes the detailed estimates of cause-specific mortality in this age group for the WHO European Region by Hmwe Kyu and colleagues² particularly welcome.

Recognition has been increasing of the fact that, although the first 1000 days of life are crucial, the subsequent 7000 days have a pivotal role in individual development and attainment of healthy adulthood. The World Bank's third edition of Disease Control Priorities in 2017 gave particular attention to child and adolescent health.³ The report particularly notes that the narrow focus on the first 1000 days "has not only resulted in a neglect of health services provision", but "also deflected research away" from older children (aged 5–9 years) and younger adolescents (aged 10–14 years). Analyses of cause-specific morbidity and mortality in this age group are generally sporadic, and the estimates by Kyu and colleagues² are therefore valuable. The primary purpose of these estimates should be to inform policy makers and other health actors to develop targeted intervention policies. Thus, the guiding principles for any such analysis would be what (are the leading causes), where (are deaths occurring), and who (is at risk)?

Globally, although communicable diseases continue to be the largest single contributor to mortality, non-communicable diseases and injuries together contribute about half of the mortality in people aged 5–14 years.¹ GBD online estimates suggest that communicable diseases caused 69% of deaths in this age group during 2015 in the WHO African Region, accounting for most of the greater all-cause mortality in that region, in contrast to the rest of the world. Injuries were the leading cause of deaths in children aged 5–14 years in all other WHO

Regions apart from the European Region, where, by 2016, non-communicable diseases are the largest contributor (44% of deaths). In the European Region, communicable diseases (particularly lower respiratory infections) were the leading cause of deaths only in the Commonwealth of Independent States (CIS).² A recent analysis of injury-related deaths among children younger than 15 years in Europe reported that, in 2015, the leading specific causes were drowning and road traffic accidents.⁴ The analysis reported a wide disparity in mortality rates for all injuries and unintentional injuries when analysed by World Bank income regions (a six-times difference between high-income countries vs low-income and middle-income countries); for some specific causes, the differences were greater, including drowning (nine times), falls (ten times), and poisonings (12 times). The analysis by Kyu and colleagues² similarly highlights the stark contrast between the most developed countries (EU15) and the least developed countries (CIS) in the WHO European Region, including a four-times difference in mortality rates from road traffic accidents and a 14-times difference from drowning.² The appendix of Kyu and colleagues' paper and other studies^{4,5} show disparities between the sexes for some causes, although not necessarily agreeing on the rates or direction of change. An analysis of linked routine data in the UK reported that self-harm (which is the sixth leading cause of death in Europe in 10–14 year olds) is not only three-times higher in girls than boys, but showed a sharp 68% increase between 2000 and 2015.⁵ By contrast, Kyu and colleagues² do not report any sex differences in the rates of self-harm across the UK, and in fact, report a 33% decrease in the number of cases of self-harm in the corresponding period.

The vast majority of deaths in people aged 5–14 years are preventable, not only in Europe but also globally. GBD analyses generally have been extremely influential in highlighting the cause-specific burden of morbidity and mortality in various age groups. Therefore, similar global and regional analyses for the 5–14 years age group based on the GBD estimates, including sex-disaggregated data for this age group that includes sex-divergent biological and behavioural risks during puberty, would undoubtedly be helpful in creating and raising awareness for child and adolescent health among policy makers and funders. These analyses should lead to

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improved provision of health care (targeted at the most vulnerable populations) and a will to enact appropriate risk reduction and legislation (eg, health and safety, smoke-free environments, and flour fortification), thereby enabling children and adolescents to attain their maximum potential.

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- 2 Kyu HH, Naghavi M, Mokdad AH. Causes of death among children aged 5–14 years in the WHO European Region: a systematic analysis of the Global Burden of Disease Study 2016. *Lancet Child Adolesc Health* 2018; published online March 19. [http://dx.doi.org/10.1016/S2352-4642\(18\)30095-6](http://dx.doi.org/10.1016/S2352-4642(18)30095-6).
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- 4 Sethi D, Aldridge E, Rakovac I, Makhija A. Worsening inequalities in child injury deaths in the WHO European Region. *Int J Environ Res Public Health* 2017; **14**: E1128.
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Efficacy of inactivated influenza vaccines in young children

The influenza virus causes infections in all age groups, and disease severity is greatest in young children and older adults. In children younger than 5 years, influenza is associated with an average of 100 000 respiratory deaths¹ and as many as 1 million hospital admissions annually.² Notwithstanding those statistics, most influenza virus infections in children are mild and self-limiting.

A wealth of evidence supports the efficacy of inactivated influenza vaccines in children aged 3–16 years.³ Far fewer trials have been done in young children younger than 2 years.³ In one controlled trial in Bangladesh, which included 4081 children aged 6–23 months, the efficacy of trivalent inactivated influenza vaccine was estimated to be 31% (95% CI 18–42%) against PCR-confirmed influenza.⁴ In *The Lancet Child & Adolescent Health*, Carine Claeys and colleagues⁵ present findings from a randomised trial in which 6006 children received a quadrivalent inactivated influenza vaccine (IIV4) and 6012 children received a control vaccine. 11 404 children (5707 children in the IIV4 group and 5697 children in the control group) were included in the primary per-protocol analysis of vaccine efficacy against PCR-confirmed influenza across five influenza seasons, and the estimated vaccine efficacy was 63% (95% CI 52–72%) against moderate-to-severe influenza and 50% (42–57%) against all influenza.⁵

We agree with the authors that protection against severe influenza necessitating hospital admission is of

greatest clinical and public health importance. However, as stated by the authors, hospital admissions were not common, and protection against severe influenza was not documented in this study. Only five children met the criteria for severe influenza, and more than half of the children with moderate-to-severe influenza had fever (>39°C) as the condition meeting the criteria for moderate influenza.

One notable observation was the moderate vaccine efficacy against influenza A(H3N2) and the high efficacy against influenza B/Victoria, despite most isolates from participating children being antigenically mismatched with the vaccine strains.⁵ As noted by Claeys and colleagues, other investigators have also found good vaccine efficacy and effectiveness against mismatched strains in young children. We would encourage a follow-up analysis to examine vaccine efficacy against matched or mismatched strains separately and that the investigators describe the degree of mismatch in more detail.

The mean follow-up period of each participant was only 4 months.⁵ More than 70% of children in this study were recruited from countries with subtropical climates where influenza circulation is known to be prolonged or even last year round.⁶ Whether or not annual vaccination can provide year-round protection in these locations should be confirmed.

Claeys and colleagues made the important observation that the relative risk of antibiotic use in children



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